



PARTIAL FLANGE BEARING FROG No.9

Class I railroads consider flange bearing technology to be the future of special trackwork applications. Progress Rail was asked to develop a partial flange bearing No. 9 solid manganese self guard-ed (SMSG) frog similar in concept to OWLS crossings.

As our engineering teams are familiar with manganese steel and its wear characteristics, Progress Rail determined that rather than making a partial flange bearing frog with a 1" deep flangeway from the start, we would incorporate a 3/4" deep flangeway. Manganese steel hardens under rolling wheel load and prior to hardening there is some deformation that occurs.

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A Caterpillar Company

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Generally, in an impact condition you lose 1/4" height of the casting section fairly fast. Additionally, in the flangeway the steel becomes confined and after some initial deformation and having no place to go, it holds its shape for a longer period. Progress Rail recognized that as such, it would experience more flange bearing than tread bearing wheels for a longer period.

The frogs pictured are in a Class I hump yard. At the time of this picture, they had been in track 8 months and have almost 1,700 cars a day pass over. Note there is some wheel tread contact, although there is still a considerable amount of flange bearing wheel contact, as well.

FEATURES AND BENEFITS

- All wheels start off being flange bearing and at 0 MPH there is little to no impact
- Surface deformation is slowed as the material is confined in the flangeway and compresses and hardens
- Minimum impact joints at rail/casting connections
- Reducing impacts at joints and flangeway openings helps maintain the ballast integrity and therefore vertical alignment
- Surface hardening will occur more gradually through rolling loads rather than impacts
- There will continue to be a combination of flange and tread bearing until the flangeway deepens to where all wheels are tread bearing
- Taper rail machining same as on RBM and Spring frogs.

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